



# CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

**NABL - Accredited Laboratory as per ISO / IEC-17025 :2005**



Job No.: CTCE/BBMP/KRIDL/W.No.12/CSR-01/235q/Cube/2016-17

22.02.2017

## TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

|                            |                                                                                                                                                    |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| * Customer                 | : Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.                                                                             |
| * Agency                   | : Technical Manager (West), KRIDL, Bangalore.                                                                                                      |
| * Name of the work         | : Improvements to main and cross roads at Reddy layout Ravindranagara Air force compound in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore. |
| * Reference                | : AEE/SSD/PR/QC/45/2016-17 Dated: 02.01.2017                                                                                                       |
| * Sample ID                | : Road Concrete                                                                                                                                    |
| Technical Reference        | : IS: 516-1959 (RA-2013)                                                                                                                           |
| Size of cubes              | : 150mmx150mmx150mm                                                                                                                                |
| Cross Sectional Area       | : 22500 mm <sup>2</sup>                                                                                                                            |
| * Grade of Concrete        | : M <sub>20</sub>                                                                                                                                  |
| Compressive Strength as on | : 28 <sup>th</sup> day                                                                                                                             |
| Sample Received on         | : 22.02.2017                                                                                                                                       |



| Sl.No. | Date of casting | Date of testing | Weight of cube (Kg) | Failure load (KN) | Compressive strength (N/mm <sup>2</sup> ) |
|--------|-----------------|-----------------|---------------------|-------------------|-------------------------------------------|
| 1      | 25.01.2017      | 22.02.2017      | 8.263               | 502.6             | 22.34                                     |
| 2      | 25.01.2017      | 22.02.2017      | 8.384               | 515.2             | 22.90                                     |
| 3      | 25.01.2017      | 22.02.2017      | 8.478               | 529.7             | 23.54                                     |

\*Information is furnished by the Customer/Representative.

**Note:**

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**VIDYARANI P.K.**  
Technical Manager



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ಸಹಾಯಕ ಕಾರ್ಯದರ್ಶಿ ಅಭಿಯಂತರರು  
ಶಿಕ್ಷಣ, ಉಪವಿಭಾಗ, ಬಾಸವೇಶ್ವರ ನಗರ  
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ  
ಎಸ್.ಎಂ. ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು



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Job No.: CTCE/BBMP/KRIDL/W.No.12/GSB-1/GR/2016-17

06.02.2017

## TEST REPORT ON GRADATION FOR CLOSE-GRADED GRANULAR SUB BASE

|                     |                                                                                                                                                    |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| * Customer          | : Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.                                                                             |
| * Agency            | : Technical Manager (West), KRIDI, Bangalore.                                                                                                      |
| * Name of work      | : Improvements to main and cross roads at Reddy layout Ravindranagara Air force compound in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore. |
| * Reference         | : AEE/SSD/PR/QC/45/2016-17 Dated: 02.01.2017                                                                                                       |
| * Sample ID         | : Close Graded - I                                                                                                                                 |
| Technical Reference | : IS: 2720 (Part 4)1985 (RA-2010), MORTH 400-1                                                                                                     |
| Date of Testing     | : 06.02.2017                                                                                                                                       |



Oven Dry Wt (gm) : 5000

| Is Sieve Size in mm | Weight Retained (gm) | Cumulative Weight Retained (gm) | Cumulative % of Retained | Cumulative % of Passing | Specified Limits |
|---------------------|----------------------|---------------------------------|--------------------------|-------------------------|------------------|
| 75.0                | 0                    | 0                               | 0.00                     | 100                     | 100              |
| 53.0                | 125                  | 125                             | 2.50                     | 97.50                   | 80-100           |
| 26.50               | 915                  | 1040                            | 20.80                    | 79.20                   | 55-90            |
| 9.50                | 840                  | 1880                            | 37.60                    | 62.40                   | 35-65            |
| 4.75                | 865                  | 2745                            | 54.90                    | 45.10                   | 25-55            |
| 2.36                | 725                  | 3470                            | 69.40                    | 30.60                   | 20-40            |
| 0.425               | 845                  | 4315                            | 86.30                    | 13.70                   | 10-25            |
| 0.075               | 410                  | 4725                            | 94.50                    | 5.50                    | 3-10             |
| PAN                 | 275                  |                                 |                          |                         |                  |
| Total               | 5000                 |                                 |                          |                         |                  |

\* Information is furnished by the Customer/Representative

**Remarks:** Satisfies MORTH Specifications as per Table 400-1, Grading I

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**Civil-tech Consultants & Engineers**

#23/14, 7th Cross, 3rd Stage, 4th Block,  
Shakthi Ganapathinagara,

Basaveshwaranagar, Bangalore-560 079.

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ಶಿಲ್ಪಕೃಷ್ಣ ಉಪಾಧ್ಯಕ್ಷ #23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara, Basaveshwaranagar, Bangalore-79.

ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ  
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Job No.: CTCE/BBMP/KRIDL/W.No.12/GSB-1/AL/2016-17

Date 06.02.2017

## TEST REPORT ON ATTERBERG LIMITS TEST FOR GRANULAR SUB BASE

|                     |                                                                                                                                                    |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| * Customer          | : Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.                                                                             |
| * Agency            | : Technical Manager (West), KRIDL, Bangalore.                                                                                                      |
| * Name of work      | : Improvements to main and cross roads at Reddy layout Ravindranagara Air force compound in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore. |
| * Reference         | : AEE/SSD/PR/QC/45/2016-17 Dated: 02.01.2017                                                                                                       |
| * Sample ID         | : Close Graded-I                                                                                                                                   |
| Technical Reference | : IS : 2720 (Part - 5)1985 (RA-2010), MORTH Table : 400-1                                                                                          |
| Date of Testing     | : 06.02.2017                                                                                                                                       |



| Sl. No. | Particulars         | Test Results | Standards as per Specifications |
|---------|---------------------|--------------|---------------------------------|
| 1       | Liquid Limit, %     | 24.00        | 25.0% Maximum.                  |
| 2       | Plasticity Index, % | Non Plastic  | 6.0% Maximum.                   |

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ಜಿಲ್ಲಾಪಟ್ಟಣ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ವಲಯ  
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ  
ಎಸ್.ಎಂ. ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು



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Job No.: CTCE/BBMP/KRIDL/W.No.12/WMM/Gradation/2016-17

09.02.2017

## TEST REPORT ON GRADATION OF WET MIX MACADAM

|                     |                                                                                                                                                    |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| * Customer          | : Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.                                                                             |
| * Agency            | : Technical Manager (West), Bangalore.                                                                                                             |
| * Name of Work      | : Improvements to main and cross roads at Reddy layout Ravindranagara Air force compound in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore. |
| * Reference         | : AEE/SSD/PR/QC/45/2016-17 Dated: 02.01.2017                                                                                                       |
| Sample ID           | : Wet Mix Macadam                                                                                                                                  |
| Technical Reference | : IS 2386 (part-1)1963 (RA-2011)                                                                                                                   |
| Date of Testing     | : 09.02.2017                                                                                                                                       |



Oven Dry Wt (gm): 5000

| Is Sieve Size in mm | Weight Retained (gm) | Cumulative Weight Retained (gm) | Cumulative % of Retained | Cumulative % of Passing | Spec.Limits As per Morth Table 400-13 |
|---------------------|----------------------|---------------------------------|--------------------------|-------------------------|---------------------------------------|
| 53                  | 0                    | 0                               | 0                        | 100                     | 100                                   |
| 45                  | 125                  | 125                             | 2.5                      | 97.5                    | 95-100                                |
| 22.4                | 1470                 | 1595                            | 31.90                    | 68.10                   | 60-80                                 |
| 11.2                | 1245                 | 2840                            | 56.80                    | 43.20                   | 40-60                                 |
| 4.75                | 515                  | 3355                            | 67.10                    | 32.90                   | 25-40                                 |
| 2.36                | 465                  | 3820                            | 76.40                    | 23.60                   | 15-30                                 |
| 0.600               | 440                  | 4260                            | 85.20                    | 14.80                   | 8-22                                  |
| 0.075               | 565                  | 4825                            | 96.50                    | 3.50                    | 0-8                                   |

\*Information is furnished by the Customer/Representative.

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ಪಟ್ಟಣಕು ಲಿಪಿವಿಚಾರಿ, ಬಾಸವೇಶ್ವರ ನಗರ

ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ, 7ನೇ ಅಂತಸ್ತು, 3ನೇ ಹಂತ, 4ನೇ ಬ್ಲಾಕ್, ಶಕ್ತಿ ಗಣಪತಿ ನಗರ, ಬಸವೇಶ್ವರನಗರ, ಬೆಂಗಳೂರು-560 079.

ಮೊ.ಎಂ. ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು-560 079. Tel Fax : 23223227, Website : www.civiltechconsultants.com

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Job No.: CTCE/BBMP/KRIDL/W.No.12/WMM/Gradation/2016-17

09.02.2017

## TEST REPORT ON GRADATION OF WET MIX MACADAM

|                     |                                                                                                                                                    |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| * Customer          | : Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.                                                                             |
| * Agency            | : Technical Manager (West), Bangalore.                                                                                                             |
| * Name of Work      | : Improvements to main and cross roads at Reddy layout Ravindranagara Air force compound in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore. |
| * Reference         | : AEE/SSD/PR/QC/45/2016-17 Dated: 02.01.2017                                                                                                       |
| Sample ID           | : Wet Mix Macadam                                                                                                                                  |
| Technical Reference | : IS 2386 (part-1)1963 (RA-2011)                                                                                                                   |
| Date of Testing     | : 09.02.2017                                                                                                                                       |



Oven Dry Wt (gm): 5000

| Is Sieve Size in mm | Weight Retained (gm) | Cumulative Weight Retained (gm) | Cumulative % of Retained | Cumulative % of Passing | Spec.Limits As per Morth Table 400-13 |
|---------------------|----------------------|---------------------------------|--------------------------|-------------------------|---------------------------------------|
| 53                  | 0                    | 0                               | 0                        | 100                     | 100                                   |
| 45                  | 110                  | 110                             | 2.2                      | 97.8                    | 95-100                                |
| 22.4                | 1545                 | 1655                            | 33.10                    | 66.90                   | 60-80                                 |
| 11.2                | 1240                 | 2895                            | 57.90                    | 42.10                   | 40-60                                 |
| 4.75                | 515                  | 3410                            | 68.20                    | 31.80                   | 25-40                                 |
| 2.36                | 465                  | 3875                            | 77.50                    | 22.50                   | 15-30                                 |
| 0.600               | 440                  | 4315                            | 86.30                    | 13.70                   | 8-22                                  |
| 0.075               | 575                  | 4890                            | 97.80                    | 2.20                    | 0-8                                   |

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ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ  
ಎಸ್.ಎಂ. ರಸ್ತೆ, ರವಿಶಂಕರ್ ನಗರ, ಬೆಂಗಳೂರು-560 079



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Job No.: CTCE/BBMP/KRIDL/W.No.12/WMM/AIV/2016-17

09.02.2017

## TEST REPORT ON IMPACT VALUE OF AGGREGATE

|                     |                                                                                                                                                    |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| * Customer          | : Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.                                                                             |
| * Agency            | : Technical Manager (West), KRIDL, Bangalore.                                                                                                      |
| * Name of Work      | : Improvements to main and cross roads at Reddy layout Ravindranagara Air force compound in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore. |
| * Reference         | : AEE/SSD/PR/QC/45/2016-17 Dated: 02.01.2017                                                                                                       |
| * Sample ID         | : Wet Mix Macadam                                                                                                                                  |
| Technical Reference | : IS : 2386( Part -4)-1963 (RA-2011)                                                                                                               |
| Date of Testing     | : 09.02.2017                                                                                                                                       |



| Sl No. | Details                                                                    | Trial No. |       | Average |
|--------|----------------------------------------------------------------------------|-----------|-------|---------|
|        |                                                                            | 1         | 2     |         |
| 1      | Total weight of aggregate sample filling the cylindrical measure = $W_1$ g | 389       | 388   | 22.65   |
| 2      | Weight of aggregate passing 2.36 mm sieve after the test = $W_2$ g         | 86        | 90    |         |
| 3      | Weight of aggregate retained 2.36 mm sieve after the test = $W_3$ g        | 303       | 298   |         |
| 4      | Aggregate Impact value = percent fines<br>$100 * (W_2/W_1)\%$              | 22.11     | 23.20 |         |

\*Information is furnished by the Customer/Representative.

### Comments:

→ Maximum allowable Aggregate Impact value for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/KRIDL/W.No.12/WMM/Shape.T/2016-17

09.02.2017

## TEST REPORT ON FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

|                     |                                                                                                                                                    |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| * Customer          | : Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.                                                                             |
| * Agency            | : Technical Manager (West), KRIDL, Bangalore.                                                                                                      |
| * Name of Work      | : Improvements to main and cross roads at Reddy layout Ravindranagara Air force compound in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore. |
| * Reference         | : AEE/SSD/PR/QC/45/2016-17 Dated: 02.01.2017                                                                                                       |
| * Sample ID         | : Wet Mix Macadam                                                                                                                                  |
| Technical Reference | : IS 2386(Part 1) 1963 (RA 2011)                                                                                                                   |
| Date of Testing     | : 09.02.2017                                                                                                                                       |



| Sl.No. | Description                           | Result |
|--------|---------------------------------------|--------|
| 1      | Flakiness Index                       | 12.52% |
| 2      | Elongation Index                      | 13.69% |
| 3      | Combined Flakiness & Elongation Index | 26.21% |

\*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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ಎಸ್.ಎಂ. ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು

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Job No.: CTCE/BBMP/KRIDL/W.No.12/CSR-01/235q/QB(BC)/2016-17

17.02.2017

## TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

|                    |                                                                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| * Customer         | : Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.                                                                             |
| * Agency           | : Technical Manager (West), KRIDL, Bangalore.                                                                                                      |
| * Name of work     | : Improvements to main and cross roads at Reddy layout Ravindranagara Air force compound in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore. |
| * Reference        | : AEE/SSD/PR/QC/45/2016-17 Dated: 02.01.2017                                                                                                       |
| * Sample ID        | : Bitumen                                                                                                                                          |
| Source/ Location   | : Hot Mix Plant, Bangalore.                                                                                                                        |
| Sample Received on | : 15.02.2017                                                                                                                                       |
| Period of Testing  | : 17.02.2017                                                                                                                                       |



The results of the tests conducted on the bitumen sample are as follows:

| Sl. No | Description                   | Test Method as per IS     | Test Result | Requirement as per IS:73:2013 |
|--------|-------------------------------|---------------------------|-------------|-------------------------------|
| 1      | Penetration at 25 °C, 1/10 mm | IS :1203 -1978 (RA -2014) | 65          | 60 to 70                      |
| 2      | Softening point, °C           | IS :1205 -1978 (RA-2014)  | 47          | Min. 45                       |
| 3      | Ductility at 27°C, cm         | IS :1208 -1978 (RA-2014)  | 100 >       | Min. 50                       |
| 4      | Flash Point, °C               | IS :1209 -1978 (RA-2014)  | 296         | Min. 220                      |

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ಜಿಲ್ಲಾಕೆ, ಬಸವನಗುಡಿ, ಬಾಸವೇಶ್ವರನಗರ  
ಬೃಹತ್ ಮಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ  
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# CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

**NABL** - Accredited Laboratory as per ISO / IEC-17025 : 2005



Job No.: CTCE/BBMP/KRIDL/W.No.12/BC/AIV/2016-17

17.02.2017

## TEST REPORT ON IMPACT VALUE OF AGGREGATES

|                     |                                                                                                                                                    |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| * Customer          | : Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.                                                                             |
| * Agency            | : Technical Manager (West), KRIDL, Bangalore.                                                                                                      |
| * Name of Work      | : Improvements to main and cross roads at Reddy layout Ravindranagara Air force compound in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore. |
| * Reference         | : AEE/SSD/PR/QC/45/2016-17 Dated: 02.01.2017                                                                                                       |
| * Sample ID         | : Hot mix plant, Bangalore.                                                                                                                        |
| * Type of Mix       | : Bituminous Concrete                                                                                                                              |
| Technical Reference | : IS: 2386 (Part- 4 )-1963 (RA-2011)                                                                                                               |
| Date of Testing     | : 17.02.2017                                                                                                                                       |



| Sl No. | Details                                                                    | Trial No. |       | Average |
|--------|----------------------------------------------------------------------------|-----------|-------|---------|
|        |                                                                            | 1         | 2     |         |
| 1      | Total weight of aggregate sample filling the cylindrical measure = $W_1$ g | 391       | 389   |         |
| 2      | Weight of aggregate passing 2.36 mm sieve after the test = $W_2$ g         | 85        | 87    |         |
| 3      | Weight of aggregate retained 2.36 mm sieve after the test = $W_3$ g        | 306       | 302   |         |
| 4      | Aggregate Impact value = percent fines<br>$100 * (W_2/W_1)$ percent        | 21.74     | 22.37 | 22.05   |

\*Information is furnished by the Customer/Representative.

### Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

### Note:

⇒ The report shall not be reproduced, except in full, without the written approval of the laboratory.

⇒ The results indicated above are based on the tests carried out on the samples received in the laboratory.

⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

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ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ  
ಎಸ್.ಎಂ. ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು

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17.02.2017

## TEST REPORT ON FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

|                     |                                                                                                                                                    |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| * Customer          | : Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.                                                                             |
| * Agency            | : Technical Manager (West), KRIDL, Bangalore.                                                                                                      |
| * Name of Work      | : Improvements to main and cross roads at Reddy layout Ravindranagara Air force compound in Ward No.12, Shettyhalli Sub Division, BBMP, Bangalore. |
| * Reference         | : AEE/SSD/PR/QC/45/2016-17 Dated: 02.01.2017                                                                                                       |
| * Sample ID         | : Hot mix plant, Bangalore                                                                                                                         |
| Technical Reference | : IS : 2386( Part -1)-1963 (RA-2011)                                                                                                               |
| * Type of Mix       | : Bituminous Concrete                                                                                                                              |
| Date of Testing     | : 17.02.2017                                                                                                                                       |



| Sl.No. | Description                           | Result |
|--------|---------------------------------------|--------|
| 1      | Flakiness Index                       | 11.56% |
| 2      | Elongation Index                      | 13.84% |
| 3      | Combined Flakiness & Elongation Index | 25.40% |

\*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

Note:

⇒ The report shall not be reproduced, except in full, without the written approval of the laboratory.

⇒ The results indicated above are based on the tests carried out on the samples received in the laboratory.

⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

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